News Release

Senior Lydia Hegge Continues Antibiotic Research

By Elizabeth Tollefson on Tuesday, July 21, 2015


Hegge and Anderson at work

University of Minnesota Crookston Senior Lydia Hegge, Mentor, Minn., quietly handles the inoculating loop, a simple tool used mainly by microbiologists to retrieve a small amount of cells from a culture of microorganisms. She meticulously introduces common pathogens such as *E. coli* onto a petri dish previously prepared with nutrient agar.

Under the guidance of Teaching Specialist Karl Anderson, Hegge is looking for rare bacterial species from the order *Actinomycetales* in soil and water samples collected locally. They are noteworthy for their potential to produce antibiotics. Isolating, characterizing, and testing a new species that possesses antibiotic properties could help in the fight against deadly pathogens that are resistant to current antibiotics.


Hegge watches Anderson in the lab.

Soil and water samples were collected from several areas in and around Crookston. So far, well over 200 hundred strains of bacteria have been cultured, and they are currently in the process of testing those strains for antibiotic properties. This testing keeps Hegge diligently at work in the lab.

The petri dishes she handles were prepared earlier with a strain of unknown bacteria, to be used for a biological assay or bioassay. The bioassay is used to determine biological activity of a substance and will show Anderson and Hegge how these soil isolates produce antibiotics against several known pathogens.

"We're excited to see if any of our sampled organisms have the potential to be a source of antibacterial substances," says Anderson. Hegge and Anderson are working on the microbiology portion of the ongoing antibiotic research of Associate Professor Venuopgal Mukku, who teaches organic chemistry on the Crookston campus.

During spring semester, Mukku asked students in his organic chemistry class if any of them were interested in summer research. Hegge stepped forward and began her work in mid-May. For the next month, she sub-cultured soil samples to purify each sample down to a single microorganism for study.

Hegge will stay involved with this phase of the research until it is completed. "I work 20-30 hours a week in the lab," Hegge says. "I have learned about lab procedure and equipment and gained valuable experience working with faculty." One of the pieces of equipment she has learned to use is the high-pressure liquid chromotography (HPLC) instrument, a technique in analytical chemistry used to separate the components in a mixture and to identify and quantify each component.


Hegge, Anderson, and Mukku continue work on antibiotic research

The HPLC instrument, along with two carbon dioxide incubators and multi-channel pipettors, are valuable pieces of research equipment provided through funding from the Office of the Vice Chancellor for Academic Affairs for this work.

Growing up on a farm, Hegge, a health sciences major, discovered a passion for tools. Combining that love with an interest in dentistry has Hegge taking a serious look at dental school applications for the fall after graduation. She dreams of a possible specialization in oral and maxillofacial surgery. For now though, she is focused on the important work at hand and is excited about its potential in the medical field.

As she looks back on her work in preparation for a future professional career, she recalls her deep interest in mathematics that began in high school, and a long with it, a new found love of physics calculations, and the always satisfying work in the laboratory. She also shares a few words of advice for incoming students gleaned from her own experience: "Try everything; do as much as you can; and don't be afraid to ask for help."

The University of Minnesota Crookston now delivers 33 bachelor's degree programs, 22 minors, and 36 concentrations on campus as well as 14 degree programs entirely online. These degrees are offered in the areas of agriculture and natural resources; business; liberal arts and education; and math, science and technology. With an enrollment of 1,800 undergraduates from more than 20 countries and 40 states, the Crookston campus offers a supportive, close-knit atmosphere that leads to a prestigious University of Minnesota degree. "Small Campus. Big Degree." To learn more, visit www.umcrookston.edu.

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In the photos:

Top, left: Senior Lydia Hegge with Teaching Specialist Karl Anderson at work in the lab.

Top, right: Hegge watches as Karl Anderson introduces pathogens onto a petri dish previously prepared with nutrient agar.

Bottom, left (left to right): Hegge, Anderson, and Mukku are involved in research that could uncover new antibiotics.

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